employment is a matter of timing. The region's local land use regulations represent a certain amount of growth, and the DRAM/EMPAL forecasts provide an indication of when that growth is likely to occur. As a result, the forecasts of 4-Lane and 6-Lane Alternatives indicate where population and employment growth would occur sooner rather than later. It should be noted that the DRAM/EMPAL modeling is based on existing comprehensive plans that dictate the location, type, and density of development. Local jurisdictions are likely to revise these regulations over the next 25 years, but we cannot anticipate what those changes might be. Our analysis, therefore, uses the best available data—the current comprehensive plans.

Indirect effects on the economy are anticipated to be minimal because the only difference between the No Build, 4-Lane, and 6-Lane Alternatives would be the timing of growth. In other words, growth would occur sooner in some areas than others, but the differences would be very small throughout the study area and would not substantially affect economic conditions.

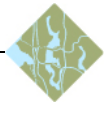
Social (including Recreation, Public Services and Utilities)

Indirect effects on the social environment could occur if the following conditions changed:

- People's ability to act or gather as a community (community cohesion)
- Access to availability of community services and recreational facilities
- Delivery of and demand for public services and utilities

As noted under the land use discussion, existing land uses in the project area would likely not change over time under either alternative. This means that the neighborhoods around the highway would remain intact because the primary land use in the project area would continue to be single-family residential. The 6-Lane Alternative would reconnect communities separated when the original SR 520 was built. The lids (10th and Delmar, Montlake, Evergreen Point, 84th Avenue Northeast, and 92nd Avenue Northeast) would provide passive recreation areas across SR 520 that would provide a gathering place for these previously divided neighborhoods.

The 4-Lane and 6-Lane Alternatives would have minimal effects on access to and availability of community services and recreational



facilities, or the delivery of and demand for public services and utilities compared to the No Build Alternative. Given the minor difference between the forecasted population and employment changes, both alternatives would have little, if any, indirect effects when compared to the No Build Alternative. The very limited potential for recreational facilities, community services, public services, and utilities to be inadequate would be minimized by the GMA requirement that services needed to support new development be in place prior to occupancy of that development.

Visual Quality and Aesthetics

Changes to the visual quality of an area tend to be immediate in time and local to the viewshed (see Appendix S, *Visual Quality and Aesthetics Discipline Report*, for more specific information about viewsheds in the project area). Because indirect effects concern effects that occur later in time and/or farther from the limits of the project area, any indirect effects on visual quality that may occur would be minimal.

Both alternatives could have an indirect effect on visual quality resulting from changes to vegetation. Existing vegetation could experience decline or die off due to stress caused by adjacent project construction activities, such as root disturbance, trimming, or breakage, or change in moisture and sun exposure levels. Alternately, the project would plant trees and shrubs that would soften views or fill in gaps in existing vegetation as they mature over time. These trees could also block newly-created views, but the change would be gradual, and if the prevailing condition was dense vegetation, the change would be a natural progression.

As discussed at the beginning of this section (*What are the project's indirect effects?*), the population and employment forecasts indicate that the pattern of development in the region would be virtually the same whether or not the project was built. Based on this modeling, neither the 4-Lane Alternative nor the 6-Lane Alternative would have a noticeable indirect effect on visual quality in the region. The only indirect effects on visual quality would be highly localized, relatively small changes similar to those described above.

Cultural Resources

Cultural resources include prehistoric and historic archeological sites, historic buildings and structures, Native American and traditional cultural properties, and other valued resources. For this project, the

Area of Potential Effect was defined and then surveyed for the presence of cultural resources. There may be National Register of Historic Places (NRHP)-eligible sites on the Eastside, beyond the current project area, that could experience indirect effects as well. Similarly, archeological or ethnographic sites beyond the Area of Potential Effect were not surveyed.

The NRHP-eligible Montlake historic district would be indirectly affected by both alternatives. Demolition of the MOHAI building would require the partial redevelopment of that portion of East Montlake Park and McCurdy Park. Any such future redevelopment would be park-related and done in cooperation with the Seattle Parks and Recreation Department. Future redevelopment of these parks would have a long-term, beneficial effect on the character of the Montlake historic district. Whether the redevelopment were to result in landscaped parkland, a recreational area, or a park staff building, it would likely have a beneficial effect on the historic district. Under both alternatives, the project as a whole would exert a long-term indirect effect on the NRHP-eligible Roanoke Park and Montlake historic districts because of sound walls, landscaping, and new bicycle/pedestrian paths (Montlake only), all of which would enhance the physical setting of the districts. This in turn could lead to further renovation of historic houses in the districts, and a return of some subdivided homes to their original single-family use. Upgrading the integrity of individual structures strengthens the overall character of the districts.

In addition to the effects listed above, the 6-Lane Alternative would also have a long-term, beneficial effect on the setting and character of the NRHP-eligible Roanoke Park and Montlake historic districts because of the 10th and Delmar and Montlake lids. The 10th and Delmar lid would reduce the exposure of the Roanoke Park historic district to SR 520, and would potentially complement the landscaping that characterizes the district. The Montlake lid would partially reunite the Montlake historic district, which is currently separated by SR 520. The lid would only partially reunite the historic district because it would not cross over the Montlake Boulevard on- and off-ramps. This landscaped lid would restore some of the original feeling of the district, and would contribute to the long-term effect of strengthening the overall character of the historic district.

Where increases in population and employment occur, demolition or insensitive development could negatively affect historic structures or

landscapes that have not yet been identified, resulting in their loss of integrity or their removal. New development could also take place on previously undeveloped land, particularly in areas northeast and east of Lake Washington (4-Lane and 6-Lane Alternative) and in Kitsap County and western Pierce County (6-Lane Alternative)—where there is the potential to disturb archeological resources. However, as stated previously, the population and employment redistribution forecasted from the No Build Alternative to the 4-Lane and 6-Lane Alternatives would be low, and neither alternative would be likely to have substantially different effects than the other.

Transportation

Appendix R, *Transportation Discipline Report*, describes the anticipated effects of the project on transportation. The transportation effects analysis is, by its nature, an indirect effects analysis because it considers effects that are later in time and are outside of the immediate project corridor. For example, the traffic analysis assesses effects in 2030, the same time frame as the indirect effects analysis, and considers traffic operations on I-5, SR 520 east of I-405, I-405, and local streets.

Exhibit 13 summarizes traffic demand on I-5 and I-405 in 2030. The percent change shown is a comparison of the 4-Lane or 6-Lane Alternative to the No Build Alternative during the a.m. and p.m. peak periods. The change in demand on I-5 and I-405 ranges from a 4 percent decrease to a 5 percent increase.

Local traffic volumes would vary between the No Build Alternative and the 4-Lane and 6-Lane Alternatives in 2030. Under the 4-Lane Alternative, traffic volumes during the a.m. peak period would decrease compared to the No Build Alternative at the Northeast 45th Street/I-5 interchange. The Mercer Street and Stewart Street interchange areas around I-5 would experience no increase in volume. The Roanoke Street/I-5 interchange would experience a 1 percent increase.

Under the 6-Lane Alternative, the overall interchange area volumes would not change along the I-5 corridor at Stewart Street, Mercer Street, Roanoke Street, and Northeast 45th Street. Traffic patterns would shift within the areas due to a shift from freeway-related trips to nonfreeway-related trips (which have different travel patterns).

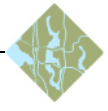


Exhibit 13. Peak Period Traffic Demand Forecasts for Adjacent Freeways in 2030 (I-5, SR 520 east of I-405, I-405)

	A.M. Peak Period				P.M. Peak Period			
			Compared to No Build				Compared to No Build	
	Existing Conditions	No Build	4-Lane	6-Lane	Existing Conditions	No Build	4-Lane	6-Lane
I-5 Southbound								
Ship Canal Bridge	6,810 vph	↑ 6%	↓ 4%	↓ 2%	7,370 vph	↑ 16%	↑ 2%	↑ 3%
South of I-5/SR 520 Interchange	7,210 vph	↑ 2%	↓ 2%	↑ 5%	7,320 vph	↑ 20%	↑2%	↑ 3%
I-5 Northbound								
Ship Canal Bridge	5,970 vph	↑ 20%	No change	↑ 3%	7,580 vph	↑ 8%	No change	↑ 5%
South of I-5/SR 520 Interchange	6,160 vph	↑ 20%	↓ 3%	↓ 1%	7,490 vph	↑ 9%	↓ 5%	↓ 3%
SR 520 (East of I-405)								
Westbound	4,440 vph	↑ 21%	No Change	↑ 5%	5,160 vph	↑ 18%	↑ 1%	↑ 3%
Eastbound	3,610 vph	↑ 20%	↓ 3%	↓ 1%	3,590 vph	↑ 14%	↓ 2%	↑ 1%
I-405 Southbound								
North of SR 520	7,670 vph	↑ 48%	↓ 1%	↓ 1%	5,880 vph	↑ 31%	↓ 1%	No Change
South of SR 520	8,040 vph	↑ 41%	No Change	No Change	6,530 vph	↑35%	No Change	↑ 2%
I-405 Northbound								
North of SR 520	4,500 vph	↑ 26%	↓ 1%	No Change	7,490 vph	↑42%	No Change	↑ 1%
South of SR 520	6,040 vph	↑ 30%	↓ 2%	↑ 1%	8,110 vph	↑39%	↓ 1%	↓ 1%

Source: *Final Submittal of Freeway and Local Traffic Forecasts and Operations* (SR 520 Project Team March 5, 2004).
Note: 4-Lane and 6-Lane Alternative changes in traffic demand are compared to the No Build Alternative.
vph = vehicles per hour

Water Resources

To assess the potential indirect effects of the proposed project on water quality, the water resources discipline team evaluated the potential for the forecasted population and employment redistribution to occur in areas with low levels of development. The water resources discipline team also considered the existing levels of impervious surface in the affected basins because the type and magnitude of any indirect effect from increased impervious surface depends on the amount of impervious surface already present in the basin. (The importance of changes in impervious surface to water quality and the greater ecosystem are described in more detail under the *What methods were used to evaluate the project's potential indirect and cumulative effects?, Changes in Impervious Surface Area* section above.) The areas most susceptible to changes in impervious surface area are those with low

levels of existing impervious surface area and the greatest increases in population and employment growth.

The heavily urbanized basins in the Seattle project area contain three major lakes—Lake Union, Lake Washington, and Lake Sammamish. The areas around Lake Union and Portage Bay are 63 percent impervious surface. The Eastside basins crossed by the project corridor range from 27 to 42 percent impervious surface. See Appendix T, *Water Resources Discipline Report*, for more information on water resources in the project area. In contrast, the basins in Kitsap County and east of Lake Sammamish, which are outside of the project corridor but could be indirectly affected by the project, are much less developed (Exhibit 11).

Compared to the No Build Alternative, the 4-Lane Alternative would primarily direct growth away from Kitsap and Pierce counties to the east side of Lake Washington in King County and to southern Snohomish County east of I-5. As described above, the areas north and east of Lake Sammamish and portions of Kitsap County are less developed than the urban corridors of Pierce, King, and south Snohomish counties adjacent to Puget Sound (Exhibit 11). The increases in population and employment would be less than 1 percent.

The forecasted population and employment redistribution from the No Build Alternative to the 4-Lane Alternative and associated increases in impervious surface would probably not produce discernable changes in the quantity or quality of water resources in the project area. With an impervious surface of 63 percent, the water resources in the Seattle project area are likely already degraded to the point that any additional increases in impervious surface could not be detected. At 27 to 42 percent impervious surface, the streams in the Eastside project area basins are also likely to be already highly degraded. Therefore, wherever increases in the amount of impervious surface from the No Build Alternative to the 4-Lane Alternative occurred, there would not likely be any detectable changes in the diversity and density of fish and insects in these water resources.

The inclusion of enhanced water quality treatment facilities in the Eastside project area should offset any effects on water quality that could be associated with increases in impervious surface under the 4-Lane Alternative. The amount of impervious surface in some of the Eastside project area basins is currently approaching the 40 to

50 percent water quality threshold, the point at which adverse effects occur from increased metal concentrations in the water and sediment.

Potential increases from the No Build Alternative to the 4-Lane Alternative in the amount of impervious surface in basins outside of the project area has the potential to degrade the aquatic habitat in the streams in those basins. For example, streams in the undeveloped areas east of Lake Sammamish (Exhibit 11), where the average amount of existing impervious surface area is less than 10 percent, would be sensitive to any changes in impervious surface resulting from the forecasted population and employment redistribution. Again, the forecasted population and employment redistribution is so small (less than a 1 percent increase) that the change may not be discernable.

Similar to the 4-Lane Alternative, the 6-Lane Alternative would direct some population and employment growth to the north and northeast of Lake Sammamish and into southern Snohomish County. The increases in forecasted population and employment in these areas, however, would be less than under the 4-Lane Alternative. Instead the Seattle area north of the Ship Canal and portions of Kitsap and Pierce counties on the east side of Puget Sound would experience a redistribution of population and employment. These areas would experience a less than 0.5 percent population and employment increase compared to the No Build Alternative. The two build alternatives would be similar in any effects on water resources, differing only in the outlying locations (Kitsap County and western Pierce County versus eastern King County and Snohomish County) where population and employment are directed.

Wetlands

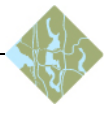
Indirect effects on wetlands could include changes in hydrology; increased noise and light; increased intrusion by people, domestic animals, or invasive plants; and/or decreased or degraded buffers associated with the redistribution of the human population. Although the specific location, nature, and extent of the effects are unknown, modeling results indicate that the build alternatives would affect development patterns in different ways.

The results of the DRAM/EMPAL model showed that compared to the No Build Alternative, the 4-Lane Alternative would generally shift population and employment growth away from the urbanized communities of Pierce, King, and Snohomish counties along Puget

Sound as well as the less developed areas of Kitsap, Pierce, and northern Snohomish counties and to the areas east and northeast of Lake Washington, including the less developed areas north and east of Lake Sammamish. As a result, there would likely be slightly greater loss or alteration of wetland habitats in those areas. Effects could include filling wetlands and/or altering wetland hydrology by modifying natural drainage and infiltration patterns. Because the magnitude of the forecasted population and employment redistribution is relatively small (less than 1 percent), the effects of the 4-Lane Alternative are difficult to measure. Individual development projects related to population and employment growth would have to comply with federal, state, and local permit regulations. These regulations require mitigation to offset adverse effects.

Under the 6-Lane Alternative, growth would occur in the heavily developed areas of north Seattle, where there is already a high percentage of impervious surface area and relatively limited wetland habitat. Portions of Kitsap County and western Pierce County would also experience population and employment growth. Some of these areas are generally rural and would be more likely to experience slightly greater loss or alteration of wetland habitats than the more urbanized areas. Because the redistribution of population and employment from the No Build Alternative to the 6-Lane Alternative would be so small, the forecasted changes may not be discernable.

Under both the 4-Lane and the 6-Lane Alternatives, increases in forecasted population and employment would occur in outlying areas (north and east of Lake Sammamish and in Kitsap and western Pierce counties) where there are potentially more wetlands and more high quality wetlands. In addition, these outlying areas would be more likely to have headwater wetlands or wetlands in the upper watershed, the loss of which could affect water storage and habitat functions. It is uncertain, however, which alternative would have a greater indirect effect. Under the 4-Lane Alternative, population and employment growth would be concentrated primarily in one less developed area, while under the 6-Lane Alternative, the population and employment increases would be less in that area, but other outlying areas would experience growth. The increases in population and employment compared to the No Build Alternative are so small that neither alternative would have a marked effect.

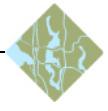


Fish Resources

Like water resources, fish resources could be indirectly affected by the redistribution of the forecasted population and employment from the No Build Alternative to the 4-Lane and 6-Lane Alternatives, if that redistribution caused the amount of impervious area to increase. The relationship between impervious surface area and water/aquatic resources is discussed in *What methods were used to evaluate the project's potential indirect and cumulative effects?* To summarize, when impervious surface area covers more than 10 to 15 percent of a watershed, the biological characteristics of the watershed are so degraded that additional changes to aquatic life are not expected. Other indirect effects on aquatic habitat occur if riparian buffers are lost or if the general water quality degrades; this can occur on newly developed or redeveloped lands. These adverse effects would likely be avoided or mitigated by permit requirements on the proposed developments.

The population and employment forecasts indicate that the redistribution of population and employment from the No Build Alternative to the 4-Lane and 6-Lane Alternatives would be small (less than 1 percent for all portions of the study area). With existing 30 to 60 percent impervious surface area in most of the potentially affected area, a 1 percent change would be inconsequential. We base this conclusion on the assumption that an increase in impervious surface area would be equal to or less than an increase in population and employment. We cannot predict a detectable change in aquatic habitat and fish resources for changes so small, as discussed in the *Water Resources* section above. Generally, where the model forecasts that the project would encourage future development in the already developed areas, such as Bellevue, effects on fish resources would not be discernable. Where the project causes development to shift to sparsely developed areas, such as north and east of Lake Sammamish and in portions of Kitsap County and western Pierce County, increased impervious surface area has a slightly higher potential to adversely affect fish habitat, although these also may be difficult to measure or detect.

There are several subbasins north and east of Lake Sammamish with low impervious surface area (0 to 10 percent) over most of the subbasin (Exhibit 11). Portions of Kitsap County and western Pierce County appear to have similar low levels of impervious surface (Exhibit 11). Small increases (0 to 0.5 percent) in forecasted population and employment have been forecasted from the No Build Alternative to the 4-Lane Alternative or the 6-Lane Alternatives in these subbasins. While

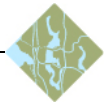


the 4-Lane Alternative would cause more growth north and east of Lake Sammamish, the 6-Lane Alternative would result in slightly less growth there but it would also direct growth to Kitsap and western Pierce counties. The projected redistribution in these more sparsely populated areas would provide a less than 1 percent change in impervious surface area within the developable portions of those areas. Under either alternative, the forecasted redistribution of population and employment would result in changes to impervious surface of less than 1 percent within the developable portions of the general area. These small changes in impervious surface area would not change fish habitat to a detectable degree, unless the growth were concentrated in a small portion of the subbasin outside of the existing urban growth boundary.

Wildlife and Habitat

As noted above, indirect effects of the project would include a redistribution of population density and development patterns from the No Build Alternative to the 4-Lane and 6-Lane Alternatives. The forecasted redistribution of population and employment could affect vegetation through the direct loss of vegetation and fragmentation of existing habitat, and indirectly through changes in hydrology and water quality. Effects on wildlife would include elimination of wildlife in areas where existing habitat is converted to buildings or other structures, and possibly reduced wildlife population abundance in adjacent areas due to reduced habitat quality (from increased noise and visual disturbance and from fragmentation). In addition, more sensitive wildlife may avoid these adjacent areas, and displaced animals may or may not find adequate available habitat in other areas. Other effects could include wildlife mortality from collisions with automobiles where new roadways are constructed and changes in fish prey abundance. Increased water-level fluctuations and other hydrologic changes could also affect wetland vegetation, with potential changes in wildlife use depending on the degree of vegetation change (this effects pathway is also described in the *Ecosystems Discipline Report*, Appendix E of this EIS).

Based on population and employment forecasts, the 4-Lane Alternative would cause slightly more population and employment growth in outlying areas to the north and east of Lake Sammamish than the No Build Alternative would. The 6-Lane Alternative would cause more population and employment growth in the outlying areas of Kitsap and western Pierce counties. The areas north and east of Lake Sammamish and in Kitsap and western Pierce counties are currently less developed



and contain more areas of intact wildlife habitat and a greater diversity of native wildlife than the more urbanized areas of Seattle and Bellevue. As described in the *Water Resources* section above, the indirect effects of the 4-Lane and 6-Lane Alternatives would not likely result in detectable changes in water quality (and therefore indirect effects on wildlife) because of changes in water quality would be imperceptible. Indirect effects on fish population abundance are not expected; consequently, measurable changes in prey abundance for wildlife that forage on fish (e.g., bald eagles) are not expected.

Under the 6-Lane Alternative, increases in forecasted population and employment over the No Build Alternative would be more evenly distributed. While some of the population and employment growth would be redistributed to more heavily urbanized areas, like Seattle, where intact wildlife habitat is limited, some of the population and employment growth would be directed toward Kitsap County and western Pierce County, which have levels of development similar to the area north and east of Lake Sammamish. Where intact habitat is removed or disturbed under the 6-Lane Alternative, effects on wildlife would be similar to the 4-Lane Alternative. Other potential indirect effects of the 6-Lane Alternative—changes in hydrology in areas of intact habitat, no detectable changes in water quality, and no change in prey abundance for wildlife that forage on fish (e.g., bald eagles)—would be similar to the 4-Lane Alternative. Given that both alternatives would redistribute population and employment increases to urbanized and less developed areas, the 4-Lane and the 6-Lane Alternative would have similar indirect effects compared to the No Build Alternative.

Geology and Soils

Indirect effects on geology and soils could include the following:

- Settlement due to consolidation of subsurface materials or movement of retaining structures
- Long-term soil erosion and transport of eroded materials downstream
- Changes to slope stability due to increased susceptibility to seismic effects
- Increased susceptibility to seismic-induced liquefaction, lateral spreading, and surface fault rupture

- Permanent alteration of the groundwater table due to topographic alteration or subsurface drainage

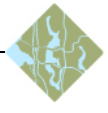
The magnitude of these effects for both the 4-Lane and 6-Lane Alternatives would be relatively small because:

- The roadways would be designed to tolerate anticipated settlement or to allow settlement to occur prior to roadway surfacing. Design and construction procedures are also available that would minimize the effect of settlement on adjacent structures.
- Exposed soils would typically be gently sloped and vegetated to minimize long-term erosion.
- Most of the highway widening would use structures instead of slopes in areas where the highway would lie below the surrounding topography; these structures would be designed to withstand seismic loading.
- The roadway and structures would be designed to either withstand the loading from seismically induced liquefaction and lateral spreading, or the soils would be altered so that liquefaction could not occur. The project is several miles away from the nearest identified surface faults.
- The project would slightly alter the topography. Because the majority of soils are of relatively low permeability, the area of influence of changes to groundwater levels would be relatively small.

See Appendix H, *Geology and Soils Discipline Report*, for more detailed information about these effects.

Air Quality

Indirect effects on air quality are included in the analysis of direct effects presented in Appendix C, *Air Quality Discipline Report*. Indirect effects are included in the direct effects because the air emission burden and ambient carbon monoxide concentration analyses are based on traffic forecast data, which include effects from growth in the region and for 2030. The air quality analysis shows that emissions are lower for the 4-Lane and 6-Lane Alternatives compared to the No Build Alternative. Consequently, no negative indirect effects are expected because the project is anticipated to slightly improve regional air quality compared to the No Build Alternative. The 6-Lane Alternative



would result in slightly higher emissions than the 4-Lane Alternative because of the slightly higher predicted vehicle miles traveled.

What are the cumulative effects of this project and other planned development and transportation projects?

Under the cumulative scenario, the redistribution of development in the study area from the No Build Alternative to the 4-Lane and 6-Lane Alternatives would be minimal. As shown in Exhibit 14, the redistribution of development at the FAZ level from the No Build Alternative to both the 4-Lane and 6-Lane Alternatives would range from an increase of less than 1 percent to a decrease of less than –0.75 percent. As evidenced by the small range of change, the redistribution of development would vary only slightly between the 4-Lane Alternative and the 6-Lane Alternative. Attachment 3 presents the population and employment distribution for the No Build Alternative under the cumulative scenario.

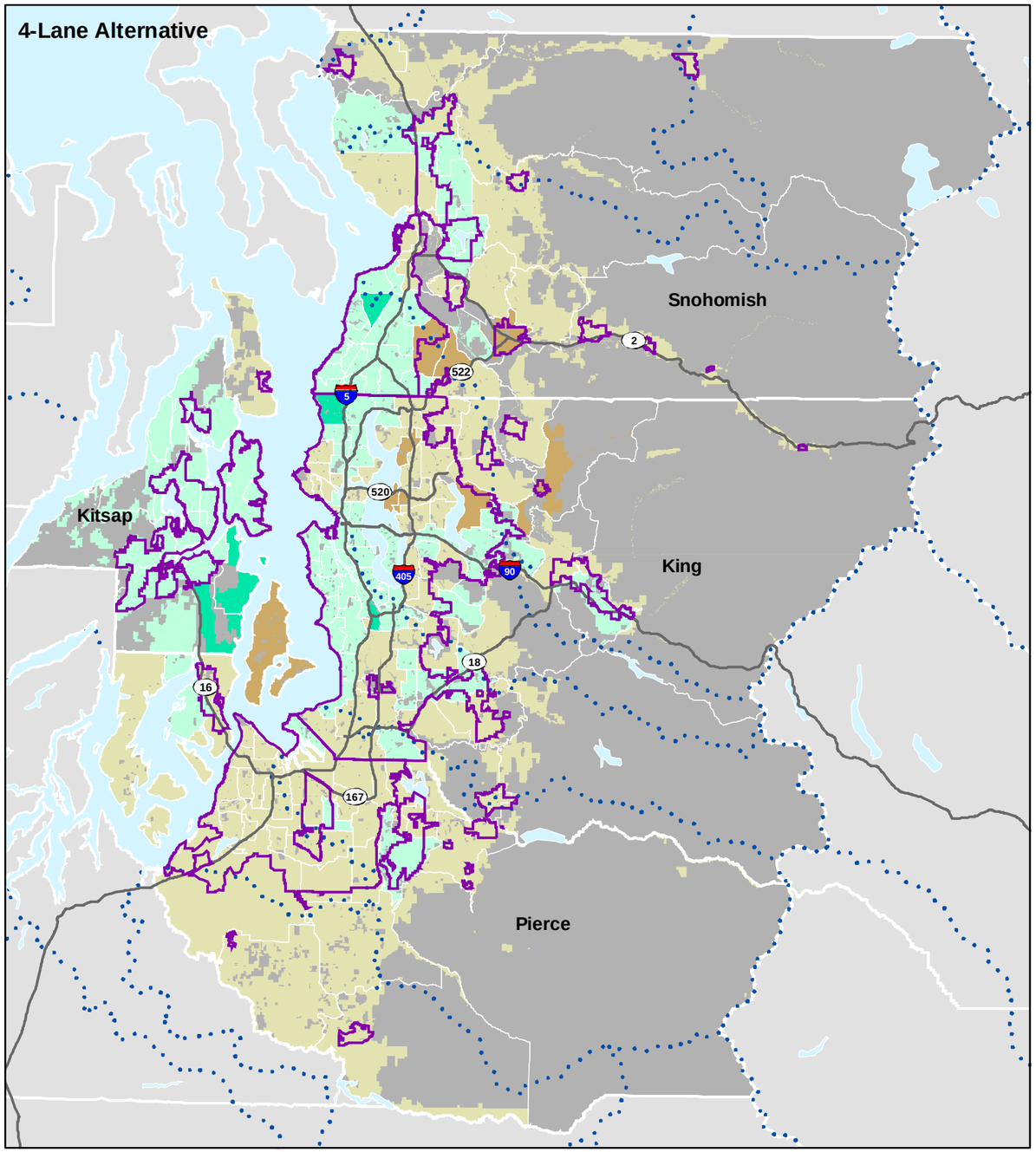
What are cumulative effects?
Cumulative effects are from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

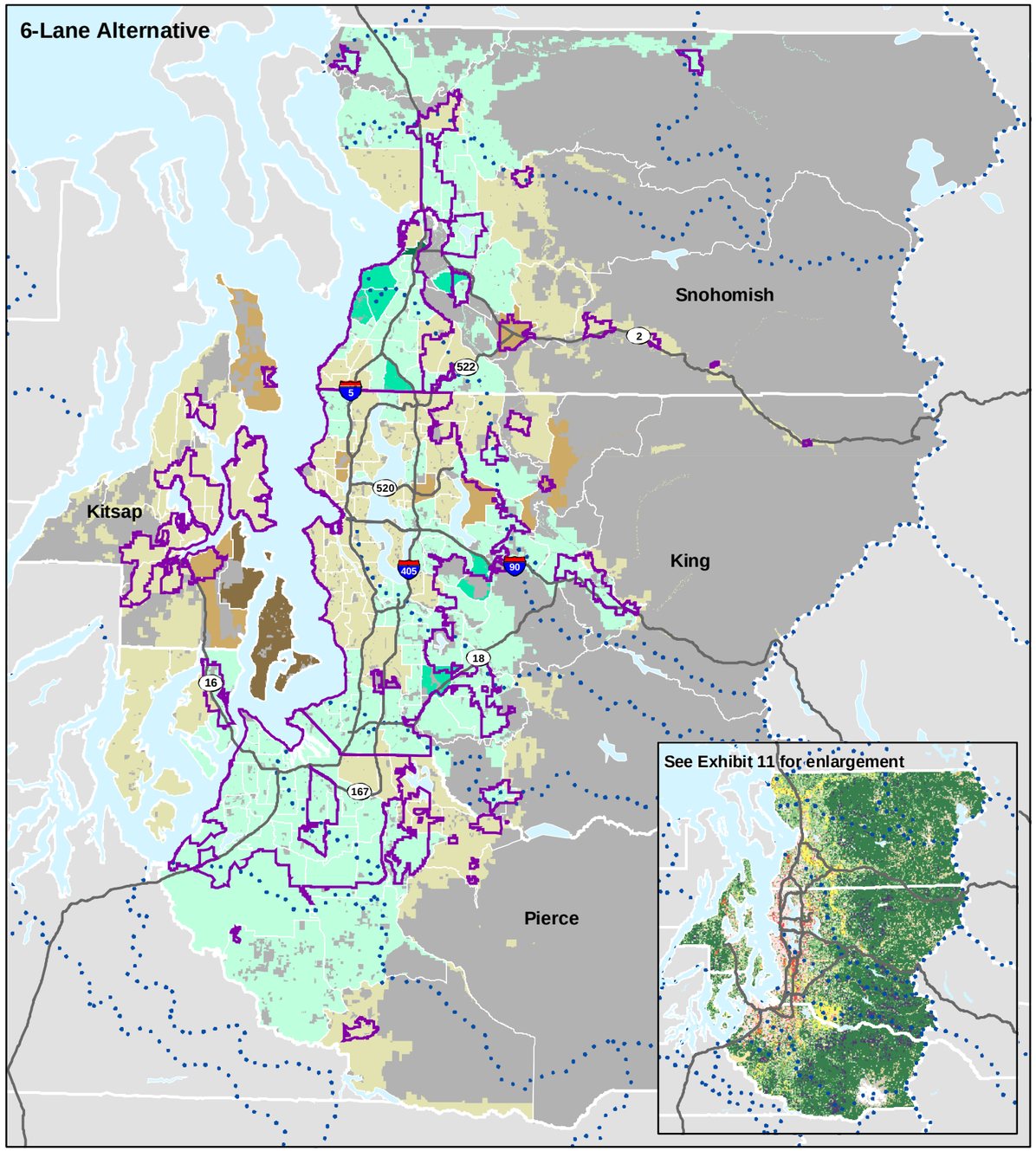
What is the cumulative scenario?
The cumulative scenario is the DRAM/EMPAL model run that takes into account existing and reasonably foreseeable transportation system. The DRAM/EMPAL model is discussed in the section titled *What methods were used to evaluate the project's potential indirect and cumulative effects?*

The cumulative scenario differs from the indirect scenario in that the cumulative scenario takes into account the reasonably foreseeable regional and high-priority local transportation projects. Based on this improved transportation network, people would make different choices about where they live and work under the cumulative scenario than they would under the indirect scenario.

Compared to the No Build Alternative, forecasted population and employment growth under the 4-Lane Alternative would occur in a north-south pattern, primarily extending from the eastern developable areas of Snohomish and King counties, and throughout Pierce County. This development pattern suggests that rather than locating on the west side of Lake Washington and crossing the Evergreen Point Bridge to get to the Eastside, people would prefer to locate to the north and south and use SR 167 and I-405.

Under the 6-Lane Alternative, development would tend toward the center of the study area when compared to the No Build Alternative. Development in the urbanized areas of Pierce County, such as Tacoma and Lakewood, would shift to Seattle. Population and employment growth in the less developed areas of Snohomish, King, and Pierce counties that does not stay in those areas would shift to Kitsap County. Under the 6-Lane Alternative, people would move more easily across the Evergreen Point





Average Percent Change in Population and Employment from No Build Alternative

- -0.75% - -0.50%
- -0.50% - -0.25%
- -0.25% - 0.00%
- 0.00% - 0.25%
- 0.25% - 0.50%
- 0.50% - 1.00%
- Urban Growth Boundaries
- Nondevelopable
- Watershed Boundaries

N

0 5 10 Miles

Source: PSRC (2004b) Population and Employment Forecast

Exhibit 14. **Weighted Average Percent Change of 2030 Population and Employment by FAZ from No Build to 4-Lane and 6-Lane Alternatives — *Cumulative Scenario***
SR 520 Bridge Replacement and HOV Project

File Path: P:\Parametrix\168395\180171 SR 520 Bridge Replacement\GIS\Layouts\IndirectCumulative\FAZ\Cumulative_Puget_Sound.mxd

Bridge and are apparently willing to locate on the west side of Lake Washington, including in Kitsap County.

The following sections describe the potential cumulative effects of the project on the following elements of the environment:

- Land Use and Economics
- Social (including Recreation, Public Services and Utilities)
- Visual Quality and Aesthetics
- Cultural Resources
- Transportation
- Water Resources
- Wetlands
- Fish Resources
- Wildlife and Habitat
- Geology and Soils
- Air Quality

Land Use and Economics

As described in more detail in the *What are the project's indirect effects?* section, the state's GMA seeks to concentrate growth in already urbanized areas and to minimize sprawl. The discipline team used forecasts of the location of 2030 population and employment under the No Build, 4-Lane, and 6-Lane Alternatives, combined with other reasonably foreseeable projects, to help determine where the alternatives would encourage development. An alternative consistent with the state GMA is considered to have fewer negative cumulative effects than an alternative that does not.

Within the project area, a potential cumulative effect on land use could be the displacement of the Hop-In Market by Sound Transit's North Link Light Rail project for the construction of a vent shaft. The SR 520 Bridge Replacement and HOV Project would displace a gas and service station. Combined, the two projects might eliminate commercial uses from this intersection and the project area. Montlake neighborhood residents would have to go elsewhere to fill their tanks, service their cars, and pick up a gallon of milk.

Within the study area, the cumulative effects of the 4-Lane and 6-Lane Alternatives compared to the No Build Alternative would be minimal, ranging from an increase of less than 1 percent to a decrease of less than 0.75 percent across the study area (Exhibit 14). Neither the 4-Lane Alternative nor the 6-Lane Alternative would clearly direct more

growth than the other alternative to urban areas versus less developed areas. This factor, combined with the small differences between the two alternatives, suggests that neither alternative would lead to more cumulative effects than the other.

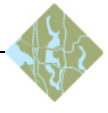
With the implementation of the regional set of transportation projects and local high-priority projects, improved mobility should trigger more efficient movement of persons and products in the region, which could therefore reduce travel costs in both gas and labor hours. According to Appendix R, *Transportation Discipline Report*, a shift from general purpose to HOV/transit demand along SR 520 would occur in the 4-Lane[2] and 6-Lane Alternatives compared to the No Build Alternative. Internal circulation on the Eastside would improve and more trips would likely remain on the Eastside due to capacity improvements along regional corridors such as I-405, SR 167, and SR 522. In addition, the additional capacity along I-405 and SR 167 should induce longer-distance north-south through trips, thus decreasing north-south through trips on I-5.

Social (including Recreation, Public Services and Utilities)

As mentioned previously, effects on the social environment could occur if the following conditions changed: people's ability to act or gather as a community (community cohesion); access to and availability of community services and recreational facilities; and delivery of and demand for public services and utilities.

Under the 4-Lane and 6-Lane Alternatives, the cumulative effects on access to community services and recreational facilities would be minimal. In addition, the delivery of public services and utilities would only be minimally affected. Effects would be minimal because the forecasted redistribution of population and employment would be similar for the 4-Lane and 6-Lane Alternatives compared to the No Build Alternative, ranging from an increase of less than 1 percent to a decrease of less than 0.75 percent. Neither alternative would have a greater effect than the other because they both direct development to urbanized and outlying less developed areas. The potential for services to be inadequate is minimized by the GMA requirement that the services needed to support new development be in place prior to occupancy of that development.

[2] The increased HOV/transit demand under the 4-Lane Alternative is attributable to the implementation of a toll to cross the Evergreen Point Bridge.



If a substantial number of the existing utilities required relocation during implementation of the regional package of transportation projects, a potential cumulative effect could be an increase in utility rates. Relocation of any utilities is usually at the expense of the utility, except if WSDOT is entitled to reimbursement by the federal government (Section 123 of the Federal Aid Highway Act of 1958). Utility relocations would be minimized through design measures for the various regional transportation projects.

Visual Quality and Aesthetics

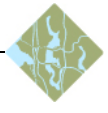
There are several proposed projects relevant to this cumulative effects analysis, most of which are local and regional long-term projects. Because most of these projects are in the planning stages, it is not possible to fully assess the ultimate effects.

Sound Transit's North Link Light Rail may contribute to cumulative effects because of added transportation structures (station, stairs, and elevators) and trains. These added structures would include a building to house a vent shaft in Montlake on properties currently occupied by the Hop-In Market and a gas and service station. Both the 4-Lane and 6-Lane Alternatives would displace the gas station, so the ultimate number of buildings at that location would not be substantially different. Neither alternative would substantially change the visual character of this location.

The visual quality of the region has changed dramatically over the years as the population has grown and land has been developed for human uses. As discussed at the beginning of *What are the project's indirect effects?*, the population and employment forecasts indicate that the pattern of development in the region would be almost the same for the No Build, 4-Lane, and 6-Lane Alternatives. Based on this modeling, the discipline team has determined that neither the 4-Lane Alternative nor the 6-Lane Alternative would have a noticeable cumulative effect on visual quality in the region.

Cultural Resources

This project has a defined Area of Potential Effect, which was surveyed by the discipline team for the presence of cultural resources. The Montlake historic district, which was determined eligible for the NRHP, could experience very minor cumulative effects due to the North Link Light Rail project. In addition, there may be NRHP-eligible sites in the study area that could experience cumulative effects as well. Cumulative



effects to NRHP-eligible sites include demolition and inappropriate or insensitive reuse. There are no known archeological or ethnographic sites in the Area of Potential Effect; however, there are a few areas of archeological high probability that could experience cumulative effects. Cumulative effects on archeological sites would result from disturbances.

Individual transportation projects are not expected to have a cumulative effect on cultural resources in the project area, with the exception of the North Link Light Rail project. The preferred route for that project, the Montlake route, is planned to go underground beneath a section of the NRHP-eligible Montlake historic district. The Montlake route would construct an emergency vent shaft adjacent to SR 520 and the Montlake historic district. This facility would displace the Hop-In Market. (The Hop-In Market, although more than 50 years old, is not considered historic due to the severe alterations it has experienced.)

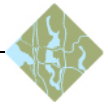
The emergency vent shaft would be 14 feet high. Sound Transit would provide opportunities for the neighborhood to have input on the design of the vent shaft to ensure cost-effective, community-sensitive designs, so the appearance of the emergency vent shaft would not be detrimental to the adjacent historic district.

The build alternatives are not expected to cause any cumulative effects compared to the No Build Alternative. The redistribution under each build alternative would be small and occur across both urbanized and less developed areas. As a result, one alternative does not stand out from the other or from the No Build Alternative in its potential to affect cultural resources.

If cultural resources are affected in the future, federal, state, and county regulatory measures are in place to protect them from adverse effects, including the National Historic Preservation Act (16 USC 470f) and its implementing regulation, Protection of Historic Properties (36 CFR 800), NEPA, and Washington's State Environmental Policy Act. In addition, properties within the unincorporated areas of King County may be protected by the King County Landmarks and Heritage Commission.

Transportation

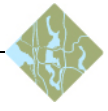
The North Link Light Rail project and the SR 520 Bridge Replacement and HOV Project would have a cumulative effect on transit service. The North Link Light Rail project would provide light rail service between



downtown Seattle and Northgate. The light rail tunnel station in the vicinity of Husky Stadium (Exhibit 8) would be the closest station to the Montlake transit stop on SR 520. Currently, transit stopping at the Montlake transit stop continues on SR 520 to I-5, serving other destinations such as downtown Seattle or Northgate. With construction of the North Link Light Rail project, the continuation of bus service from the Montlake transit stop to downtown Seattle and Northgate may not be cost-effective to operate. In addition, downtown traffic congestion could be kept to a lower level if some buses were removed from downtown streets, given that light rail would displace buses from the downtown transit tunnel. SR 520 transit riders may need to transfer to North Link light rail. Currently, transit riders who disembark at the Montlake transit stop en route to the University of Washington must either transfer to another bus on Montlake Boulevard or walk. The walk from Montlake Boulevard to Husky Stadium is approximately 1/3 mile. WSDOT, Sound Transit, and King County Metro Transit are currently working together to determine the best means of providing transit services following the implementation of the North Link Light Rail project and the SR 520 Bridge Replacement and HOV Project.

The cumulative effects of the 4-Lane and the 6-Lane Alternative on transportation are described in detail in Chapter 10 of Appendix R, *Transportation Discipline Report*. With the implementation of a regional set of transportation projects and local high-priority projects, a considerable shift from general purpose to HOV/transit on SR 520 would occur under the 4-Lane and 6-Lane Alternatives compared to the No Build Alternative. Internal circulation on the Eastside would improve and more trips would be likely to remain on the Eastside due to capacity improvements along regional corridors such as I-405, SR 167, and SR 522, rather than across Lake Washington. In addition, an increase in longer-distance, north-south through trips is expected to occur in the I-405 corridor due to the additional capacity along I-405 and SR 167, with a corresponding decrease in longer-distance north-south through trips on the west side of Lake Washington.

The construction schedules for the various capacity improvements along I-405, SR 167, and SR 522 have not been firmly established. If more than one of these projects, including the SR 520 Bridge Replacement and HOV Project, are under construction at the same time, the potential of traffic congestion and delays would increase. WSDOT would work internally or with project sponsors to minimize the potential for delays.



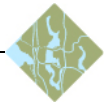
Water Resources

As discussed above in *What methods were used to evaluate the project's potential indirect and cumulative effects?*, the physical and chemical characteristics of basins with an average impervious surface area less than 40 to 50 percent are susceptible to changes in impervious surface. A comparison of the redistribution of forecasted population and employment growth under the 4-Lane Alternative and the 6-Lane Alternative does not clearly indicate that one alternative more than the other would direct growth away from less developed areas to more developed areas. (See the introduction to this section, *What are the cumulative effects of this project and other planned development and transportation projects?*) The differences between the alternatives would be minor (less than 1 percent). Overall, the cumulative effect of either the 4-Lane or the 6-Lane Alternative on impervious surface would not likely further degrade water quality resources at any detectable level compared to the No Build Alternative.

Wetlands

Researchers have acknowledged the difficulty in assessing cumulative effects on wetlands because of the large spatial and temporal scales involved, the range of ecological processes that occur in natural systems, and the lag times between a given land use activity and the resulting effects (Sheldon et al. 2003). Nevertheless, there is evidence to suggest that individual actions can lead to changes in wetland structure and function that accumulate over time to cause more pronounced effects as a whole.

Several planned transportation projects such as the I-405 roadway improvements and various local arterial projects could contribute to cumulative effects on wetlands near the project area. These projects could fill or alter wetland habitat and increase impervious surface in the project vicinity. Because the disturbances would be closely spaced geographically, the effects could be magnified (compared to disturbances that occur over a wider area, where effects can dissipate). Specific effects that could occur due to the expanded roadway system would include increased noise and loss/alteration of wetland vegetation, which reduce habitat value for some wildlife species; reduced storage area for storm and flood water; and loss or reduction of wetland buffer, which may put remaining wetlands at greater risk for disturbance and human intrusion. The location, timing, and extent of these effects are unknown.



The effects caused by the redistribution of development from the No Build Alternative to the 4-Lane and 6-Lane Alternatives combined with other local transportation projects could reduce the amount, quality, and functional effectiveness of wetlands in the project area. The differences in cumulative effects between the 4-Lane and 6-Lane Alternative are minor, however, with population and employment growth occurring within a range of less than 1 percent for each FAZ and neither alternative clearly directing more growth to less developed areas than the other.

The transportation projects and other individual development projects would be required to mitigate effects by providing replacement wetlands and complying with state, federal, and local laws, including stormwater management regulations. In general, the mitigation that would be provided to offset wetland losses would compensate for the cumulative effects.

Fish Resources

A number of transportation projects are planned in the vicinity of the project area, including the I-405 Congestion Relief and Bus Rapid Transit Projects, I-90 Two-Way Transit and HOV Operations, and Sound Transit's North Link Light Rail. None of these projects are predicted to change impervious surface area to a degree that would detectably alter fish habitat. Forecasted population and employment redistribution from the No Build Alternative to the 4-Lane and 6-Lane Alternatives would be less than 1 percent for all portions of the study area. These small differences in population and employment would not increase the amount of impervious surface area enough to detectably affect fish habitat. Furthermore, neither alternative would clearly direct more growth to less developed areas than the other alternative. The cumulative effects of the 4-Lane or 6-Lane Alternative combined with the I-405, I-90, and other roadway projects would improve fish habitat by improving culverts, stream crossings, and riparian buffers in previously developed areas where fish habitat is currently adversely affected. Federal, state, and local regulations are in place to address such adversely affected areas.

There is no discernable difference between the 4-Lane and 6-Lane Alternatives in their cumulative effects on fish resources. Each alternative would result in a small redistribution of the forecasted population and employment. The redistributed population and

employment would not produce changes in impervious surface area that would detectably affect fish habitat.

Wildlife and Habitat

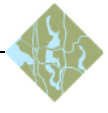
Construction associated with this project, as well as other foreseeable future transportation and development projects, would contribute to further vegetation and habitat loss and degradation, and to a decline in wildlife abundance. Foreseeable future transportation projects are expected to have similar types of wildlife effects; the magnitude of effect would depend on the type, size, and location of the given transportation project. Considering these other projects together with the 4-Lane or 6-Lane Alternative, direct habitat loss and disturbance is expected to result in reduced population abundance of sensitive wildlife species in the vicinity.

Neither the 4-Lane Alternative nor the 6-Lane Alternative would clearly direct more growth to less developed areas than the other alternative. Consequently, cumulative effects from the 4-Lane Alternative and the 6-Lane Alternative would be similar for wildlife and habitat. However, the effects would be so small, they may be undetectable.

Geology and Soils

Cumulative effects related to geology and soils may occur during the construction of other transportation projects because the construction of two or more projects in the same vicinity or multiple transportation projects require the use of limited aggregate resources.

The preferred route of the North Link Light Rail project would pass beneath the SR 520 alignment (under both the 4-Lane and 6-Lane Alternative) near Montlake Boulevard. The top of the light rail tunnel would be approximately 140 feet below existing ground at SR 520. Construction of the tunnel would likely require dewatering; dewatering for SR 520 construction would be minimal. Both projects address dewatering during construction (Sound Transit 2003; Appendix H, *Geology and Soils Discipline Report*). Over the long term, the groundwater flow gradient at the light rail tunnel is very low, so the likelihood of the tunnel impeding groundwater flow would be negligible. The near surface soils affected by the SR 520 construction are of low permeability, so the long-term effect on groundwater flow would also be negligible. Based on these soil conditions, cumulative effects would be very small.



The construction of both the 4-Lane and 6-Lane Alternative would involve using aggregates (sand and/or gravel) for pavement, pavement subbase, concrete bridge structures, foundations, and embankments constructed during wet weather. Approximately 1.1 million tons of aggregate would be needed for the 4-Lane Alternative and 1.6 million tons for the 6-Lane Alternative (see Appendix H, *Geology and Soils Discipline Report,* for more information). The estimated quantity of aggregate needed for the I-405 Congestion Relief and Bus Rapid Transit Projects is 3.5 million tons (WSDOT 2002). Aggregate needed for the North Link Light Rail and the SR 99: Alaskan Way Viaduct & Seawall Replacement projects have not been reported (Sound Transit 2003, WSDOT 2004b), but they might be expected to use similar volumes, bringing the total use for all four projects to nearly 10 million tons over the next 10 or more years, or an annual average of 1 million tons or less. By comparison, the annual average Washington state consumption of aggregate is roughly 77 million tons (Washington Aggregates and Concrete Association 2004).

Air Quality

Cumulative effects on air quality result from the changing distribution of traffic caused by the project and other reasonably foreseeable transportation projects (see Attachment 1 for a list of these projects). While the primary goal of many transportation projects is to increase capacity, thereby reducing traffic congestion and associated tailpipe emissions, some areas may actually experience an increase in traffic volumes and congestion, possibly resulting in localized increases in vehicle tailpipe emissions.

The 4-Lane and 6-Lane Alternatives would direct forecasted population and employment growth to different urbanized and outlying areas. The urbanized areas that experience the most growth could experience increases in motor vehicle emissions near high-volume intersections. Because there is not a clear distinction between the two build alternatives and the No Build Alternative regarding their effects on urban and nonurban areas, neither alternative can be said to have greater cumulative effects than the other.

Regionwide, it is anticipated that the effect of either the 4-Lane or the 6-Lane Alternative combined with other foreseeable transportation projects would be to reduce traffic congestion in comparison to the No Build Alternative, resulting in lower air emissions and improved air quality.

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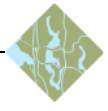

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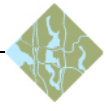

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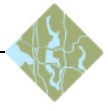

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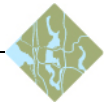


Attachment 1

Cumulative Transportation System

Attachment 1

Cumulative Transportation System

The transportation system modeled for the cumulative effects scenarios includes the following:

- Regional high-priority projects (including the I-405 Corridor 10-15 Year Implementation Plan)
- High-priority local arterial projects within the study area that have either undergone or are currently undergoing some form of environmental review

Exhibit 1-1 summarizes projects considered high-priority regional projects included in the cumulative effects scenarios. Exhibits 1-2 and Exhibit 1-3 provide a list of high-priority local arterial projects in Seattle and on the Eastside, respectively, also included in the cumulative effects scenarios. The projects with asterisks are those that are also included in the direct/indirect travel modeling for the project.

Exhibit 1-1. Regional High-Priority Projects

Corridor	Regional Capacity Improvements
I-405	• Add one lane in each direction from I-90 in Bellevue to SR 520 • Add one lane in each direction from I-5 to SR 167 in Tukwila, except eastbound between SR 181 and 167 • Add two lanes in each direction from SR 167 in Tukwila to Southeast 8th Street in Bellevue • Add one lane in each direction from Southeast 8th Street in Bellevue to SR 520 • Add two additional lanes from SR 520 to Northeast 124th Street • Add two lanes in each direction from SR 520 to Northeast 124th Street • Add one lane in each direction from Northeast 124th Street to SR 522[a] • On SR 167, add one additional lane in each direction between I-405 and South 180th Street • Construct Bus Rapid Transit line with stations, HOV direct access ramps, park-and-ride lots, and bus service • Expand the vanpool program
I-90	• Two-way, all-day transit and HOV lanes—Alternative R-8A (no rail crossing)
Sound Transit	• Sound Transit Link Light Rail between SeaTac and Northgate, Sounder Commuter Rail, and Sound Transit Regional Express Bus[a]
Alaskan Way Viaduct	• Existing capacity (4/6 lane expressway) [a]
SR 167	• Add 1 general purpose lane in each direction from South 180th Street to the Pierce/King County line vicinity • Add 1 HOV lane in Auburn (15th Northwest to 15th Southwest)
SR 509	• 6-lane freeway with HOV lanes between I-5 and South 188th • Six miles of improvements on I-5 from South 320th in Federal Way to South 200th and connection of SeaTac International Airport's South Access Expressway to SR 509 and I-5.
SR 519 Phase I and Phase II Improvements	• South Royal Brougham Way and Atlantic Street grade-separated
SR 518	• Add direct access ramp from southbound SR 509 to eastbound SR 518[a] • Construct a third eastbound lane on SR 518 from the Airport North Access Expressway
SR 99 North Bus Rapid Transit (BRT) Facilities	• Complete Business, Access, and Transit (BAT) lanes, build sidewalks, upgrade traffic signals and expand selected intersections in accordance with the Aurora Corridor Improvement Plan

[a]Included in direct/indirect travel model.

Exhibit 1-2. High-Priority Local Arterial Projects in Seattle

Corridor	Arterial Capacity Improvements	
	Direction	Number of Lanes
Mercer Corridor[a]		
Valley Street	Eastbound and Westbound	1 through lane/ direction and turn pockets
Mercer Street From 5th Avenue North to Dexter Avenue North	Eastbound and Westbound	3 lanes/direction
Mercer Street From Dexter Avenue North to Fairview Avenue North[b]	Eastbound Westbound	4 lanes 3 lanes
Westlake Avenue North Aloha Street to Denny Way	Northbound and Southbound	2 lanes/direction
9th Avenue North Aloha Street to Denny Way	Northbound and Southbound	1 through lane/ direction and turn pockets
Broad Street: Dexter Avenue North to 5th Avenue North		Deleted out of the network
Thomas Street: From 6th Avenue North to Dexter Avenue North[c]	Eastbound and Westbound	1 through lane direction
Lake City Way[d]		
Bus Only (and right turns) lane from 3 p.m. to 7 p.m. This is accomplished by restricting on-street parking during this time. The bus-only lane is for the following areas: • Northgate Way to 30th Avenue Northeast/Northeast 123rd Street • Northeast 130th Street to Northeast 145th Street	Northbound	1 bus-only lane
Bus Only (and right turns) lane from 6 to 9 a.m. This is accomplished by restricting on-street parking during this time. The bus-only lane is for the following areas: • Northeast 145th Street to Northeast 130th Street • 30th Avenue Northeast/Northeast 123rd Street to Northgate Way	Southbound	1 bus-only lane

[a](http://www.ci.seattle.wa.us/transportation/ppmp_mercer.htm). This description of improvements assumes the "Two-Way Mercer with Alaskan Way Viaduct Widened Mercer Option" (http://www.ci.seattle.wa.us/transportation/pdf/mercerwidenoption.pdf).

[b]By Year 2030, it is assumed that 4 lanes will be needed in the eastbound direction.

[c]Included in direct/indirect travel model.

[d](http://www.ci.seattle.wa.us/transportation/lakecitywayne.htm).

Exhibit 1-3. 2014 Committed High-Priority Local Arterial Projects on the Eastside

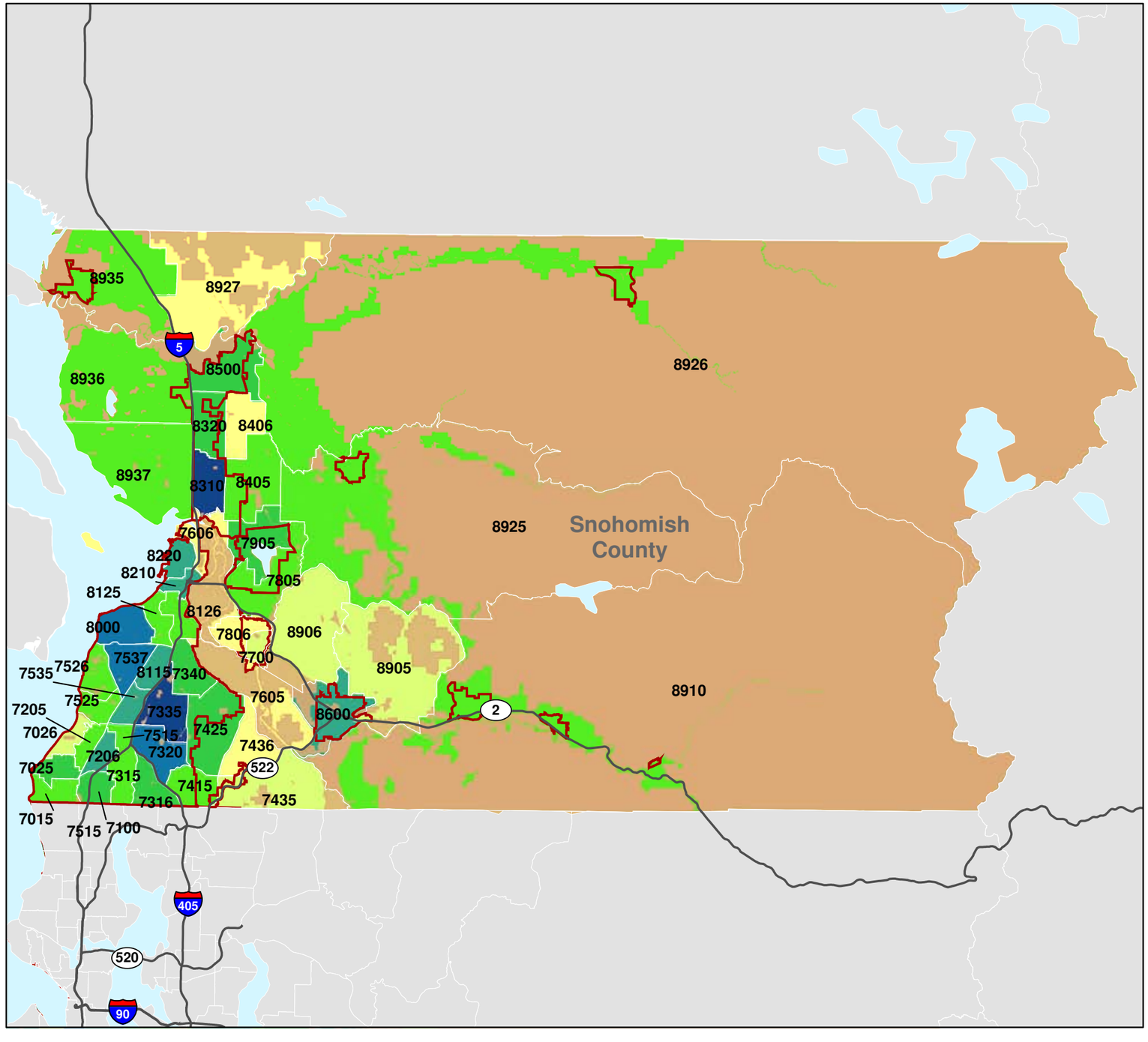
Corridor (Jurisdiction)	Arterial Capacity Improvements
120th Northeast/39th Southeast (Bothell, Snohomish)[a]	Northeast 195th to Maltby Road: 4/5 lanes including new connection
Northeast 29th Place (Bellevue)	148th Avenue Northeast to Northeast 24th Street: Construct new 2-lane road
SR 524 (Snohomish County)[a]	24th Street Southwest to SR 527: Widen to 4/5 lanes including sidewalks, bike lanes
Northeast 120th Street (Kirkland)[a]	Slater Avenue to 124th Avenue Northeast: Construct new 3-lane roadway with ped/bike facilities
SR 202 (Redmond) [a]	East Lake Sammamish Parkway to Sahalee Way: Widen to 3/5 lanes; intersection improvements with bike/ped facilities
Northeast 90 Street (Redmond)[a]	Willows Road to SR 202: Construct new 4/5 lanes + bike facilities
West Lake Sammamish Parkway (Redmond)	Leary Way to Bel-Red Road: Widen to 4/5 lanes + CGS, bike lanes
Oakesdale Avenue Southwest (Renton)[a]	Southwest 31st to Southwest 16th: Construct new 5-lane roadway with CGS
140th Avenue Southeast (King County)[a]	SR 169 to Southeast 208th Street: Widen to 5 lanes SR 169 to Southeast 196th Street, widen for turn channels on Southeast 196th. Combines two King County CIP projects. A major north-south arterial which serves the Soos Creek Plateau and Fairwood.
Juanita-Woodinville Way (King County)[a]	Northeast 145th Street to 112th Avenue Northeast: Widen to 4/5 lanes + CGS, walkway/pathway
Northeast 124th Street (King County)[a]	Willows Road to SR 202: Widen to 3/4 lanes + CGS, bike facilities; traffic signal.
Woodinville-Snohomish Road/140th Avenue Northeast (Woodinville)[a]	Northeast 175th Street to SR 522: Widen to 4/5 lanes + CGS, bike lanes
150th Avenue Southeast (Bellevue)[a]	Southeast 36th to Southeast 38th: Widen to 7 lanes; add turn lanes
Willows Road (Redmond)*	Channelization of Willows Road/Redmond Way intersection and widening of Willows Road from Northeast 116th to Northeast 124th
39th Avenue Southeast (Snohomish County)[a]	Realignment at SR 524 and York Road: Construct 4-way intersection to replace two offset intersections
SR 520/SR 202 Interchange (Redmond)[a]	Complete interchange by constructing a new ramp and through lane on SR 202 to SR 520 (ETP R-29). Note: Part of Nickel Package

Source: The I-405 10-15 Year Implementation Plan

[a]Included in direct/indirect travel model.

Attachment 2

2030 Population and Employment Distribution: Indirect Scenario



FAZ	FAZ Name	Indirect Scenario				
		No Build Total	4-Lane		6-Lane	
			Change	% Change	# Change	% Change
7015	Woodway / Esperance	21,807	0	0.00	76	0.35
7025	Edmonds South	31,482	-63	-0.20	-6	-0.02
7026	Edmonds North	11,787	-35	-0.30	-24	-0.20
7100	Mountlake Terrace	36,012	-52	-0.14	72	0.20
7205	Lynnwood West	28,651	-28	-0.10	-19	-0.07
7206	Lynnwood East	44,328	-117	-0.26	-52	-0.12
7315	Brier	28,415	-61	-0.21	-50	-0.18
7316	Hilltop	32,720	90	0.28	-22	-0.07
7320	North Creek	51,522	86	0.17	-23	-0.04
7335	Mill Creek / Silver Lake	66,582	-48	-0.07	-109	-0.16
7340	Eastmont	37,926	-18	-0.05	-40	-0.11
7415	Canyon Park	29,523	129	0.44	29	0.10
7425	Clearview / Silver Firs / Snohomish Cascade	36,918	124	0.34	33	0.09
7435	Maltby / High Bridge	11,866	55	0.46	5	0.04
7436	Cathcart	9,708	78	0.80	36	0.37
7515	Alderwood Mall	21,776	-49	-0.23	-29	-0.13
7525	Lake Serene / Norma Beach	22,889	-42	-0.18	-43	-0.19
7526	Harbour Pointe	24,976	-46	-0.18	-58	-0.23
7535	Swamp Creek	41,753	-46	-0.11	-60	-0.14
7537	Paine Field	55,441	-19	-0.03	-37	-0.07
7605	South Snohomish Valley	2,746	9	0.33	0	0.00
7606	North Snohomish Valley	3,622	2	0.06	0	0.00
7700	Snohomish	16,731	53	0.32	-32	-0.19
7805	Fobes Hill	29,189	-47	-0.16	-67	-0.23
7806	Machias / Cavalero Corner	8,927	20	0.22	-14	-0.16
7905	Lake Stevens / Frontier Village	39,941	-118	-0.30	-134	-0.34
8000	Mukilteo / Southwest Everett	56,415	-69	-0.12	198	0.35
8115	Everett Mall	47,458	-70	-0.15	-66	-0.14
8125	Forest Park / Beverly Park	26,532	-37	-0.14	-53	-0.20
8126	Pinehurst / Lowell	26,006	-36	-0.14	-38	-0.15
8210	Everett CBD	43,963	-47	-0.11	-47	-0.11
8220	North Everett	46,331	-34	-0.07	-58	-0.13
8310	Marysville	66,653	-135	-0.20	-105	-0.16
8320	North Marysville / Smokey Point	30,497	-59	-0.19	-50	-0.16
8405	Getchell Hill	24,872	-62	-0.25	-62	-0.25
8406	Sisco Heights	3,520	-6	-0.17	-7	-0.20
8500	Arlington	39,232	-91	-0.23	-97	-0.25
8600	Monroe Area	42,056	177	0.42	12	0.03
8905	Meadow Lake / Woods Creek	10,020	50	0.50	-2	-0.02
8906	Three Lakes	12,119	60	0.50	5	0.04
8910	Skykomish Valley	23,167	106	0.46	-4	-0.02
8925	Granite Falls	27,986	-21	-0.08	-10	-0.04
8926	Oso / Darrington	23,421	-47	-0.20	-41	-0.18
8927	Bryant	7,891	-23	-0.29	-17	-0.22
8935	Stanwood	25,908	-17	-0.07	-33	-0.13
8936	Lakewood / Warm Beach	28,474	-17	-0.06	-6	-0.02
8937	Tulalip	25,815	-26	-0.10	-40	-0.15

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Urban Growth Area
Nondevelopable
7112 FAZ Number

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Exhibit 2-1. **2030 Population and Employment for Snohomish County by FAZ under the No Build Alternative—*Indirect Scenario***
SR 520 Bridge Replacement and HOV Project

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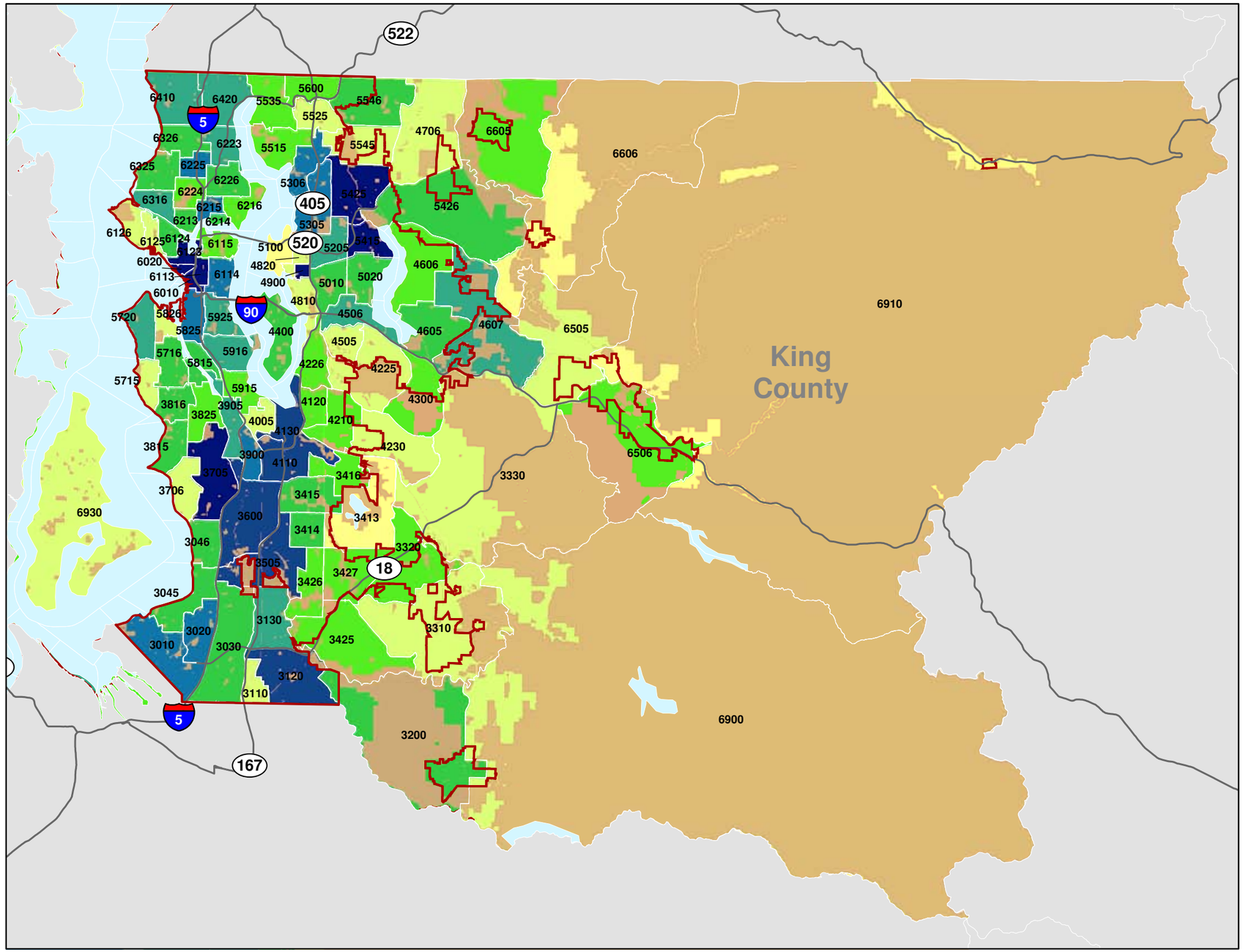

FAZ	FAZ Name	Indirect Scenario				
		No Build	4-Lane		6-Lane	
		Total	# Change	% Change	# Change	% Change
3010	Twin Lakes	55,469	-81	-0.15	-50	-0.09
3020	Central Federal Way	58,729	-64	-0.11	-59	-0.10
3030	Lakeland	38,980	-62	-0.16	-25	-0.06
3045	Redondo / Woodmont	31,333	-53	-0.17	-53	-0.17
3046	Des Moines	35,783	-37	-0.10	-49	-0.14
3110	Algona / Pacific	15,094	-16	-0.11	11	0.07
3120	Auburn South	61,186	-49	-0.08	-6	-0.01
3130	Auburn North	44,925	18	0.04	-47	-0.10
3200	Enumclaw Plateau	31,011	-67	-0.22	-56	-0.18
3310	Black Diamond / Lake Sawyer	19,627	-14	-0.07	-20	-0.10
3320	Covington / Timberlane	27,532	-33	-0.12	-62	-0.23
3330	Maple Valley / Hobart	16,332	-24	-0.15	-40	-0.24
3413	Lake Youngs	9,197	-5	-0.05	0	0.00
3414	Kentridge	30,582	19	0.06	4	0.01
3415	Panther Lake	34,131	67	0.20	32	0.09
3416	Fairwood	24,454	43	0.18	-21	-0.09
3425	Lake Heights	21,080	-4	-0.02	-14	-0.07
3426	Southwest Soos Creek	27,035	-16	-0.06	-24	-0.09
3427	Lake Meridian	23,045	0	0.00	-19	-0.08
3505	Kent CBD / Kent East Hill	61,612	-3	0.00	-63	-0.10
3600	Kent Industrial	64,769	21	0.03	-26	-0.04
3705	Sea-Tac	79,837	-134	-0.17	-69	-0.09
3706	Normandy Park	18,724	-24	-0.13	-13	-0.07
3815	Burien / Seahurst	32,719	0	0.00	-20	-0.06
3816	White Center / Shorewood	30,093	-18	-0.06	-34	-0.11
3825	Boulevard Park	24,844	1	0.00	-1	0.00
3900	South Tukwila	50,933	-73	-0.14	-31	-0.06
3905	North Tukwila / Riverton	42,278	-60	-0.14	-39	-0.09
4005	Skyway / Bryn Mawr	14,721	40	0.27	4	0.03
4110	Renton Industrial	65,408	153	0.23	10	0.02
4120	Renton Highlands	23,880	100	0.42	22	0.09
4130	Renton Airport / CBD	60,788	120	0.20	2	0.00
4210	East Renton	20,825	34	0.16	-16	-0.08
4225	Cougar Mountain	12,905	40	0.31	-25	-0.19
4226	Newport Hills	22,358	54	0.24	15	0.07
4230	Renton Plateau	11,327	14	0.12	-10	-0.09
4300	Issaquah	22,140	-6	-0.03	-33	-0.15
4400	Mercer Island	30,752	-8	-0.03	-40	-0.13
4505	South Bellevue	18,227	78	0.43	-12	-0.07
4506	Eastgate / Vasa Park	45,203	196	0.43	-26	-0.06
4605	Klahanie / Pine Lake	35,604	76	0.21	-27	-0.08
4606	Sahalee	26,311	136	0.52	19	0.07
4607	Beaver Lake	41,443	77	0.19	-55	-0.13
4706	North Bear Creek	18,501	163	0.88	59	0.32
4810	West Bellevue	18,970	78	0.41	3	0.02
4820	Northwest Bellevue	13,288	111	0.84	60	0.45
4900	Bellevue CBD	82,935	396	0.48	136	0.16
5010	Central Bellevue	38,117	209	0.55	21	0.06
5020	East Bellevue / Lake Hills	31,786	183	0.58	0	0.00
5100	Point Cities	7,829	33	0.42	29	0.37

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Nondevelopable
Urban Growth Area
7112 FAZ Number

N

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Exhibit 2-2a. **2030 Population and Employment for King County by FAZ under the No Build Alternative –*Indirect Scenario*** (Part 1 of 2)
SR 520 Bridge Replacement and HOV Project

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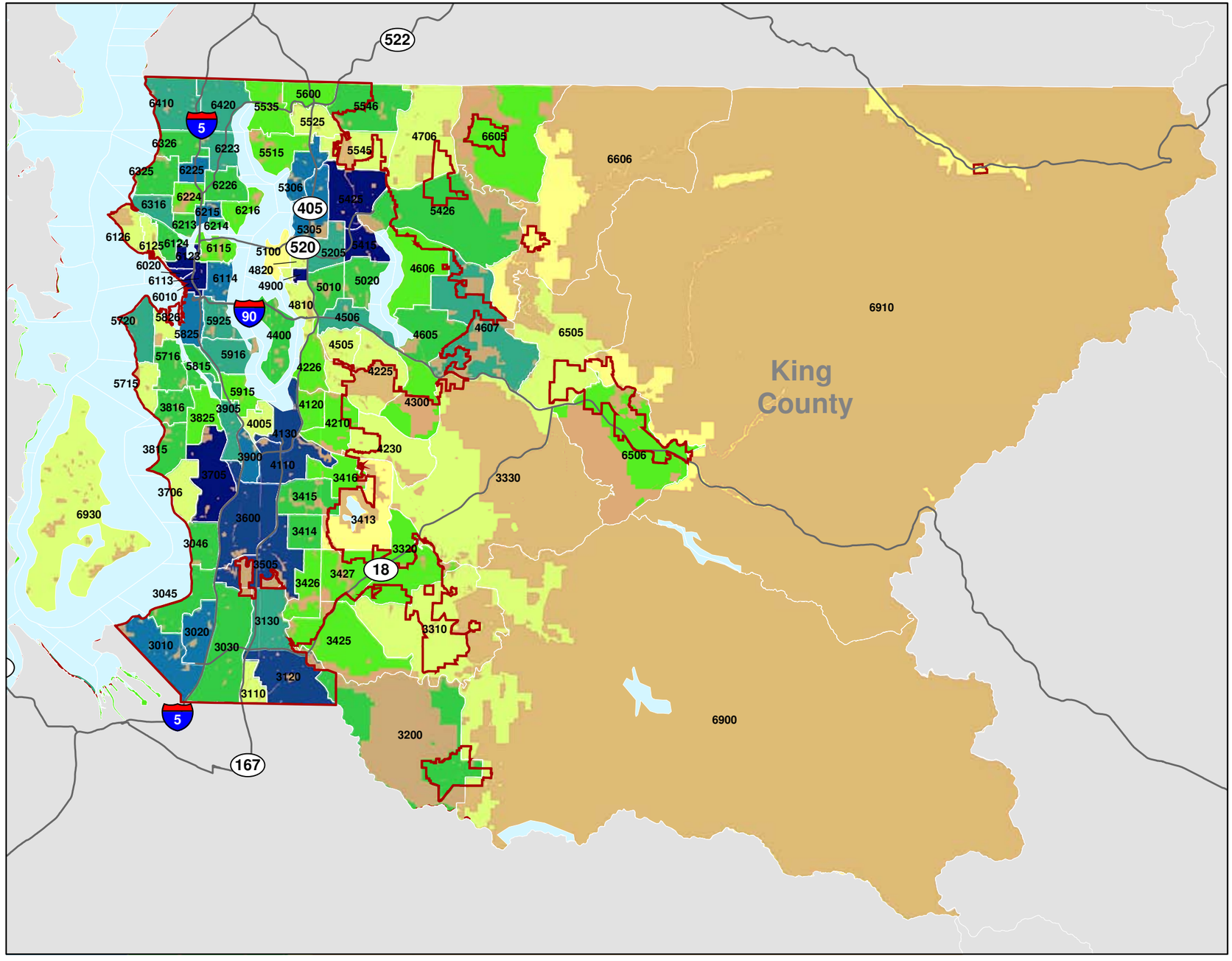

FAZ	FAZ Name	Indirect Scenario				
		No Build	4-Lane		6-Lane	
		Total	# Change	% Change	# Change	% Change
5205	North Bellevue	46,106	297	0.64	213	0.46
5305	Kirkland / Houghton	52,745	336	0.64	220	0.42
5306	Kirkland / Totem Lake	50,810	240	0.47	-5	-0.01
5415	Redmond / Overlake	76,118	256	0.34	132	0.17
5425	Redmond CBD	77,671	542	0.70	162	0.21
5426	Redmond / Union Hill	36,668	300	0.82	173	0.47
5515	Juanita / Finn Hill	26,620	145	0.54	13	0.05
5525	Norway Hill / North Kingsgate	18,298	82	0.45	10	0.05
5535	Kenmore / Inglewood	27,984	-7	-0.03	-54	-0.19
5545	Kingsgate / Hollywood Hill	15,920	118	0.74	32	0.20
5546	Woodinville	30,620	186	0.61	71	0.23
5600	Bothell	27,785	124	0.45	5	0.02
5715	Fauntleroy / Arbor Heights	16,583	-6	-0.04	-6	-0.04
5716	Delridge / Highland Park	33,238	-35	-0.11	-13	-0.04
5720	Alki / Admiral	42,462	-77	-0.18	-22	-0.05
5815	Lower Duwamish / Boeing Field	31,236	-40	-0.13	-18	-0.06
5825	Industrial District	52,228	-38	-0.07	-4	-0.01
5826	Upper Duwamish / Harbor Island	12,481	-29	-0.23	-9	-0.07
5915	Rainier Beach	29,796	-94	-0.32	-54	-0.18
5916	South Beacon Hill / Columbia	47,721	-83	-0.17	-91	-0.19
5925	North Beacon Hill / Mount Baker	46,411	-125	-0.27	-90	-0.19
6010	Seattle CBD	178,348	-65	-0.04	38	0.02
6020	Denny Regrade	94,040	-38	-0.04	43	0.05
6113	First Hill / Broadway	75,263	-58	-0.08	68	0.09
6114	East Capitol Hill / Central Area	57,772	-68	-0.12	39	0.07
6115	North Capitol Hill / Madison Park	28,766	-50	-0.17	58	0.20
6123	Lake Union / Seattle Center	108,272	44	0.04	163	0.15
6124	Queen Anne	36,994	-53	-0.14	10	0.03
6125	Interbay	19,626	-1	-0.01	21	0.11
6126	Magnolia	13,634	-19	-0.14	8	0.06
6213	Wallingford / Fremont	31,563	-22	-0.07	48	0.15
6214	University Of Washington	35,557	6	0.02	11	0.03
6215	Ravenna / University District	50,857	18	0.04	177	0.35
6216	Windermere / Laurelhurst	21,405	-11	-0.05	71	0.33
6223	Lake City	40,351	4	0.01	84	0.21
6224	Green Lake	25,676	1	0.00	83	0.32
6225	Northgate	50,280	-5	-0.01	166	0.33
6226	Wedgewood / View Ridge	32,661	20	0.06	144	0.44
6316	Ballard	45,502	7	0.02	63	0.14
6325	Greenwood / Crown Hill	39,405	8	0.02	128	0.32
6326	Broadview / Haller Lake	38,589	17	0.04	147	0.38
6410	Richmond Highlands	49,449	-2	0.00	117	0.24
6420	North City	42,440	-40	-0.09	143	0.34
6505	Fall City / Preston	14,375	15	0.10	-29	-0.20
6506	North Bend / Snoqualmie	27,489	21	0.08	-80	-0.29
6605	Duvall	21,584	91	0.42	28	0.13
6606	Carnation	6,545	20	0.31	12	0.18
6900	Cumberland / Southeast King County	10,670	-19	-0.18	-24	-0.22
6910	East King County	3,942	15	0.38	0	0.00
6930	Vashon Island	13,720	13	0.09	-8	-0.06

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Nondevelopable
Urban Growth Area
7112 FAZ Number

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Exhibit 2-2b. **2030 Population and Employment for King County by FAZ under the No Build Alternative –*Indirect Scenario*** (Part 2 of 2)

SR 520 Bridge Replacement and HOV Project

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